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ABSTRACT

The reading performances of fifteen blind readers and fifteen sighted readers were compared by evaluating the reading performances of each reader reading at instructional level from Lippincott's "Basic Reading Series" and from Form A of the "Gray Oral Reading Test." Nine matched pairs of subjects read at grade one first reader level and six pairs read at grade three second reader level of the Lippincott graded basal series. Subjects' miscues or reading errors were analyzed according to the criteria Goodman and Burke established for the Reading Miscue Inventory. The subcategories under the categories of graphic similarity, sound similarity, grammatical function, grammatical relationships, and comprehension were analyzed for each reader. Some of the results indicated that braille readers applied phonic cues more efficiently than did visual readers, while they did not apply grammatical and semantic cues as efficiently as did sighted readers. Braille readers' miscues caused a greater loss of comprehension than did visual readers' miscues. (MKM)

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Braille Reading Is Less Efficient Than Visual Reading

The Study

Braille reading is less efficient than sight reading. This conclusion is supported by a study comparing the reading performances of fifteen blind readers and fifteen sight readers. Each subject read at his instructional level from two different sources: 1) Lippencott's Basic Reading Series, 2) Form A Gray Oral Reading Test. The criteria for the instructional level in reading adhered to are those defined for the Informal Reading Inventory (IRI): failing to apply the appropriate word attack skills to at least two but not more than five words in a

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100 running words; demonstrating 75 per cent comprehension. According to the Lippencott graded basal series (Basic Reading Series), there were nine matched pairs of subjects reading at grade one first reader level; six pairs at grade three second reader level. Subjects were also matched for ethnicity and native language.

Subjects' miscues or reading errors were analyzed according to the criteria Goodman and Burke (1972) established for the Reading Miscue Inventory (RMI). Only the subcategories under the categories: graphic similarity, sound similarity, grammatical function, grammatical relationships, and comprehension in the RMI are a part of the design of this study.

1. Graphic Similarity. How much does the miscue look like what was expected?

		high	some	none
Student reads:	a) walk for walked	x		
	b) alligator for apartment		x	
	c) that for and			x

2. Sound Similarity. How much does the miscue sound like what was expected?

Student reads:	a) try for tried	x		
	b) odor for adore		x	
	c) away for any			x

3. Grammatical Function. Is the grammatical function of the miscue the same as the grammatical function of the word in the text?

		identical	different	indeterminate
Student reads:	a) The dough raised.			
For:	The dough rose.	x		
	b) The car garage...			
	The car skidded...		x	
	c) They have...(student corrects)			
	They were here yesterday.			x

Grammatical Relationships (Strength, Partial Strength, Weakness, Overcorrection). A miscue assigned to the subcategory: Strength indicates that the reader demanded that his reading-language make sense in the constructs of grammar and semantics. An illustration:

Student first reads:	I saw the on sat at the table.
Student corrects:	I saw one seat at the table was empty.

A miscue classified as demonstrating partial strength suggests that the reader is relying on syntax without considering meaning cues. An illustration:

Student first reads:	Out noises came from the old house.
For:	Loud noises came from the old house.
Student correction:	Thick noises came form the old house.

Miscues expressing weakness occur when the reader does not use either grammatical or semantic cues. An illustration:

Student first reads:	He walked slowly as is he were lost.
For:	He walked slowly as if he were lost.
Student correction:	He walked slowly as it he were lost.

An overcorrection occurs when a reader makes a correction that is not essential for comprehsnsion. An illustration:

Student first reads:	John gave the lady a box of candy.
For:	John gave the woman a box of candy.
Student correction:	John gave the woman a box of candy.

Comprehension (No Loss, Partial Loss, Loss). A miscue assigned to the subcategory: No Loss indicates that no meaning loss occurred because of the miscue. An illustration:

Student reads:	Dad was running around telling everyone what to do.
For:	Dad was running around and telling everyone what to do.

The following is an illustration of a miscue resulting in a partial loss of meaning.

Student reads:	The hammer fell from the table on to his foot.
For:	The hammer slipped off the table and fell on his toe.

A miscue which results in the total loss of meaning is classified under the sub-category: Loss. An illustration:

Student reads:	She took off the table and put it on her purse.
For:	She took it off the table and put it in her purse.

The Results

Table 1 presents the statistical data derived by analysis of variance. The interaction column, Visual-Blind (VB) versus Gray-Lippencott (GL), shows only one significant interaction out of a possible 16. Visual readers overcorrected more in the Lippencott material than did the braille readers. Braille readers overcorrected more in the Gray Oral materials. Since overcorrection is not a serious miscue, we can conclude that subjects' performances did not vary significantly due to materials. Thus, the absence of any serious interactions significant at the .05 level of statistical confidence due to subjects reading from two different sources of materials increases the significance of the study.

The Gray Oral versus Lippencott column contains the data which signify how all subjects' performances differed according to the source of reading material. There were no significant differences for the categories of graphic and sound similarities. For grammatical function, subjects' miscues which had identical parts of speech resulted in mean values of: 1) Gray Oral materials: 59.3, 2) Lippencott: 68.9. This difference was significant at the .05 level of

Table 1

Means and F Ratio Values

Reading Miscue Inventory	Gray vs. Lippen. Means	F	Visual vs. Blind Means	F	VB vs. GL Means	F
Graphic						
high	(G) 65.2 (L) 65.2	0.0	(V) 44.8 (B) 85.6	93.2**	(VG) 47.0 (VL) 42.7 (BG) 83.5 (BL) 87.8	1.1
some	(G) 20.0 (L) 20.5	0.0	(V) 33.5 (B) 7.0	49.2**	(VG) 31.8 (VL) 35.5 (BG) 8.2 (BL) 5.8	0.6
none	(G) 16.7 (L) 13.9	0.5	(V) 23.6 (B) 7.0	20.6**	(VG) 25.2 (VL) 22.1 (BG) 8.3 (BL) 5.7	0.0
Sound						
high	(G) 43.5 (L) 36.1	2.1	(V) 32.3 (B) 47.3	7.7**	(VG) 36.0 (VL) 28.5 (BG) 50.9 (BL) 43.7	0.0
some	(G) 29.4 (L) 26.0	0.7	(V) 38.6 (B) 16.8	26.6**	(VG) 39.9 (VL) 37.2 (BG) 18.9 (BL) 14.8	0.0
none	(G) 27.1 (L) 37.9	3.9	(V) 29.2 (B) 35.8	1.5	(VG) 24.1 (VL) 34.3 (BG) 30.1 (BL) 41.5	0.0
Grammatical Function						
identical	(G) 59.3 (L) 68.9	5.1*	(V) 74.8 (B) 53.4	13.8**	(VG) 68.7 (VL) 80.9 (BG) 49.7 (BL) 56.9	0.4
indeterminate	(G) 2.6 (L) 5.1	2.4	(V) 3.4 (B) 4.3	0.3	(VG) 2.8 (VL) 4.1 (BG) 2.5 (BL) 6.2	0.6
different	(G) 38.1 (L) 26.3	6.3*	(V) 21.8 (B) 42.3	16.6**	(VG) 28.5 (VL) 15.0 (BG) 47.7 (BL) 37.6	0.1
Grammatical Relationships						
strength	(G) 32.1 (L) 41.6	8.1**	(V) 51.3 (B) 22.4	30.0**	(VG) 47.3 (VL) 55.2 (BG) 16.8 (BL) 28.1	0.3
partial strength	(G) 17.3 (L) 16.7	0.0	(V) 11.2 (B) 22.7	8.7**	(VG) 14.4 (VL) 8.1 (BG) 20.3 (BL) 25.4	3.4
weakness	(G) 45.8 (L) 34.1	6.6*	(V) 31.0 (B) 48.8	13.5**	(VG) 35.9 (VL) 26.1 (BG) 55.6 (BL) 42.0	0.2
overcorrection	(G) 5.4 (L) 7.5	1.0	(V) 7.2 (B) 5.7	0.5	(VG) 3.7 (VL) 10.6 (BG) 7.1 (BL) 4.3	5.1*
Comprehension						
no loss	(G) 27.5 (L) 38.1	8.9**	(V) 48.0 (B) 17.6	50.8**	(VG) 39.5 (VL) 56.4 (BG) 15.4 (BL) 19.8	3.1
partial loss	(G) 22.6 (L) 22.3	0.0	(V) 28.0 (B) 17.0	9.4**	(VG) 30.9 (VL) 25.1 (BG) 14.3 (BL) 19.6	2.4
loss	(G) 50.0 (L) 39.2	8.4**	(V) 24.1 (B) 65.1	80.9**	(VG) 30.0 (VL) 18.5 (BG) 70.2 (BL) 60.0	0.0

**Significant at the .01 level of confidence.
*Significant at the .05 level of confidence.

statistical confidence. For being different parts of speech the means are: Gray Oral: 38.1; Lippencott: 26.3. This yields an F value of 6.3 which is significant at the .05 level. Thus, from the perspective of grammatical function, subjects found the Gray Oral materials more difficult than the Lippencott.

The grammatical difficulty of the Gray Oral material was also expressed in grammatical relationships. The means values of the miscues which indicated strength or a demand that reading-language make sense on the bases of grammar and meaning are: 1) Gray Oral: 32.1, 2) Lippencott: 41.6. The F value of 8.1 is significant at the .01 level of confidence. For weakness, the failure to use either grammatical or semantic cues, are: Gray Oral: 45.8; Lippencott: 34.1. These means are significantly different at the .05 level of confidence.

As one would expect, subjects comprehended better the Lippencott material. Mean values of miscues which resulted in no loss of comprehension are: 1) Gray Oral: 27.5, 2) Lippencott: 38.1. The F value of 8.9 is statistically significant at the .01 level of confidence. Means for miscues resulting in loss of comprehension are: Gray Oral: 50.0; Lippencott: 39.2 which resulted in an F value of 8.4 and is significant at the .01 level of statistical confidence.

Since both groups of subjects' performances agreed that the Gray Oral material was more difficult from the perspectives of grammatical function, grammatical relationships, and comprehension no interactions occurred on these important points. However, when blind subjects' performances are statistically compared to that of visual subjects, 13 of the 16 comparisons made are significantly different at the .01 level of confidence. The visual subjects' performances

yielded smaller means than blind subjects when miscues had a quality which indicated more efficient reading and larger means when miscues had a quality which suggested more efficient reading. Thus, under the category of graphic similarity blind subjects' miscues has a mean of 85.6 in the subcategory of high graphic similarity as opposed to 44.8 for the visual subjects. The large mean of 85.6 indicates that blind subjects depended more upon phonic skills than did visual subjects. This dependence upon phonic skills resulted in blind subjects achieving a larger mean (43.3) for the subcategory of high sound similarity than that achieved (32.3) by visual subjects.

Even though braille readers applied phonic cues more efficiently than did visual readers, they did not apply grammatical and semantic cues as efficiently as did the sight readers. The large mean of 74.8 achieved by sight readers in the subcategory of identical (The miscue being the same part of speech as the word in the text.) under the category of grammatical function as opposed to the mean of 53.4 achieved by braille readers indicates that sight readers made better use of grammatical cues. The more efficient application of grammatical cues resulted in the producing of more means on the part of visual subjects which could be classified in the subcategory of strength under the category of grammatical relationships. Thus, the mean for the visual subjects is 51.3 while it is only 22.4 for the blind subjects. For miscues which indicate weakness (The reader does not use either grammatical or semantic cues), the mean for braille readers is 46.8; for sight readers: 31.

Of course, braille readers demonstrated that their miscues caused a

greater loss in comprehension than did visual readers' miscues. In the subcategory of loss under the category of comprehension, we see a mean of 65.1 for miscues committed by braille readers which resulted in a loss of meaning. For sight readers, the mean is: 24.1. In the subcategory of no loss, the mean is 48 for visual subjects and 17.6 for blind subjects. Thus, we can conclude that braille reading is less efficient than sight reading.

Discussion

The visual subjects' performance is similar to that reported by Biemiller (1970), Weber (1970) and Williamson and Young (1974). The performance of the blind subjects is so radically different from visual subjects that it raises the question again: How much control does language have upon perception? The thoery of linguistic relativity or the Sapir-Whorfian hypothesis (Carroll, 1967) may best be tested by studying and comparing the cognitive performances of the congenital deaf, congenital blind, and normal subjects. The performance of the blind subjects in this study tend to support Vygotsky's (1970) premise that language and intelligence have different genetic roots. Too much of the educational load may be carried by language since reading is of prime importance. Certainly, language has not provided the blind subjects in this study the same degree of comprehension that visual subjects demonstrated. The results show that blind subjects were not as efficient in applying either surface or deep structure as defined by Wardhaugh (1972) as were the visual subjects. The role of language in learning should be re-evaluated using novel rather than traditional techniques.

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